

Notice of Allowability	Application No.	Applicant(s)	
	10/594,114	NORO ET AL.	
	Examiner	Art Unit	
	EDWARD MARTELLO	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to 08 March 2010.
2. An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. The allowed claim(s) is/are 10-16.
4. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some* c) None of the:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) hereto or 2) to Paper No./Mail Date _____.
 - (b) including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
7. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. Notice of References Cited (PTO-892)
2. Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. Notice of Informal Patent Application
6. Interview Summary (PTO-413),
Paper No./Mail Date 20110901.
7. Examiner's Amendment/Comment
8. Examiner's Statement of Reasons for Allowance
9. Other _____.

/Edward Martello/
Examiner, Art Unit 2628

/XIAO M. WU/
Supervisory Patent Examiner, Art Unit 2628

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08 March 2010 has been entered.

2. Claims 10, 15 and 16 are currently amended, claims 11-14 are as previously presented and claims 1-9 were previously cancelled, thus, claims 10-16 are pending in the application.

EXAMINER'S AMENDMENT

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

4. Authorization for this examiner's amendment was given in a telephone interview with Lawrence Stahl, # 30,110, on 01 September 2011.

5. Claim 16 has been changed to add the term non-transitory after the first word in the claim and is as follows:

Claim 16, (Currently Amended) A non-transitory computer-readable storage medium encoded with a computer program for an image processing method of compositing an image of a virtual object and an image of a physical space to generate a mixed reality image and causing a HMD to display the mixed reality image, comprising the steps of: holding 3D CG rendering data and scene graph data, wherein the 3D CG rendering data contains data representing geographical shape and color of the virtual object, texture data, and data representing the position and orientation of the virtual object, and wherein the scene graph data is data in which the 3D CG rendering data is hierarchical managed on the basis of the parent-child relationship between components of the virtual object; providing an image capturing unit, which is attached to the HMD, to capture the image of the physical space; measuring a position and orientation of the HMD with a first measurement unit; operating an object manipulation unit, by a user wearing the HMD, in order to position and orient the virtual object; measuring a position and orientation of the object manipulation unit with a second measurement unit; receiving a user instruction of editing the virtual object, input by the user using an operation panel, wherein the operation panel is arranged at a position in the physical space within a viewing field of the image capturing unit attached to the HMD and displays an operation panel image which is used for editing the virtual object, and contains a region for hierarchically displaying information about each of the components in accordance with the scene graph data held in the database; generating the operation panel image by using the data held in the database with an operation panel image generation unit and outputting the generated operation panel image to the operation panel arranged at the position in the physical space within the viewing field of said image capturing unit; updating the data held in the database according to the user instruction received via the

operation panel and the measurement result of the second measurement unit, and rendering, by using the updated data, the image of the virtual object according to the measurement results of the first and second measurement units; compositing the rendered image of the virtual object and the captured image of the physical space to generate the mixed reality image; and displaying the generated mixed reality image on the HMD, to which the image capturing unit is attached.

Reasons for Allowance

6. The following is the Examiner's statement for reasons for allowance: In response to the RCE and amendment received 08 March 2010, the Examiner has determined that the amended claims have overcome all the art of record and that art deemed available in an updated search as shown in the record, thus claims 10-16 are in condition for allowance.

7. With regard to claim 10, in summary claiming an image processing apparatus for compositing an image of a virtual object and an image of a physical space to generate a mixed reality image and causing a HMD to display the mixed reality image, comprising: a database which holds 3D CG data and scene graph data, wherein the 3D CG rendering data contains data representing geographical shape and color of the virtual object, texture data, and data representing the position and orientation of the virtual object, and wherein the scene graph data is data in which the 3D CG rendering data is hierarchically managed on the basis of the parent-child relationship between components of the virtual object; an image capturing unit which is attached to the HMD and captures the image of the physical space; a first measurement unit which measures a position and orientation of the HMD; an object

manipulation unit which is used by a user wearing the HMD in order to operate a position and orientation of the virtual object; a second measurement unit which measures a position and orientation of said object manipulation unit; an operation panel which can be operated by the user, arranged at a position in the physical space within a viewing field of said image capturing unit attached to the HMD, displays an operation panel image which is used for editing the virtual object and contains a region for hierarchically displaying information about each of the components in accordance with the scene graph data held in the database, and is capable of receiving a user instruction of editing the virtual object input by the user; an operation panel image generation unit which generates the operation panel image by using the data held in said database, and outputs the generated operation panel image to said operation panel; a rendering unit which updates the data held in said database according to the user instruction received via said operation panel and the measurement result of said second measurement unit, and renders, by using the updated data, the image of the virtual object according to the measurement results of said first and second measurement units; a composition unit which composites the image of the virtual object rendered by said rendering unit and the image of the physical space captured by said image capturing unit to generate the mixed reality image; and a HMD, to which said image capturing unit is attached, which displays the mixed reality image generated by said composition unit are unique features and non-obvious over the art of record.

8. Claim 15 and 16, claiming a method and a non-transitory computer readable medium respectfully, have like features and scope of claim 10 and are likewise determined to be unique and non-obvious over the art of record.

9. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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